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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/590,005	05/03/2007	Andre Peter Steynberg	41952/297847	7129

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EXAMINER
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WARTALOWICZ, PAUL A

ART UNIT	PAPER NUMBER
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1793

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/590,005	<b>Applicant(s)</b> STEYNBERG, ANDRE PETER	
	<b>Examiner</b> PAUL A. WARTALOWICZ	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 26 January 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 21-40 is/are pending in the application.
- 4a) Of the above claim(s) 35-40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/06/06</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election of claims 21-34, Group I in the reply filed on 1/26/10 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### ***Claim Objections***

Claim 29 is objected to because of the following informalities: claim 29 is missing a period. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 33 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The recitation in claim 33 of "initially generating maximum steam" renders the claim indefinite. It is unclear what the maximum amount of steam generated can be. This maximum would depend on variables not limited in the claim such as how many passages there. For the purposes of examination, this limitation is interpreted as requiring steam to be produced by heat exchange as the heat transfer medium.

Clarification and/or correction is requested.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 21-25, 27, 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Retallick (US 2004/0060238) in view of GB 2006814 ('814) and Anand (US 5435836) and Benham (US 5324335).

Retallick teaches a method of producing synthesis gas [0001] wherein hydrocarbon and air are combusted to provide heat to the reforming passages [0007], while hydrocarbons are steam reformed in other passages containing catalysts [0007]. Additionally, Retallick teaches subjecting the synthesis gas produced by reforming to water gas shift (this appears to meet the limitation of treating at least a portion of the cooled synthesis gas to produce a hydrogen feedstock, [0049]) and passing air, as a heat exchange fluid, through a passage not producing synthesis gas to cool the reforming process (it appears that the flow of a relatively cool heat exchange medium

Art Unit: 1793

would cool the passages it flows through also, [0049]). Additionally, hot synthesis gas is separated from other heat transfer medium exiting other reforming passages (via conduits) so that they do not mix as illustrated in figure 3, #36, 37, 38, 33, 34, 35. See also [0041].

Retallick fails to teach cooling the hot synthesis gas by heat exchange with water to produce steam and to provide cooled synthesis gas.

'814 teaches a method of making synthesis gas (page 1, lines 4-20) hot synthesis gas is heat exchanged with water to produce steam to be used in the steam reforming process (page 1, lines 77-88).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide the hot synthesis gas of Retallick heat exchanged with water in order to produce steam to be used in the steam reforming process (page 1, lines 77-88) as taught by '814.

Regarding the limitation in claims 21, 30 of transferring hydrogen produced from synthesis gas to a primary process (Fischer-Tropsch), Benham teaches steam reforming a fuel to produce synthesis gas wherein the hydrogen produced therefrom is transferred to a Fischer-Tropsch reactor (col. 6) for the purpose of meeting start up demand (col. 11, lines 14-25).

Retallick fails to teach supplying said hydrogen feedstock to the primary process for producing synthesis gas.

Art Unit: 1793

Anand, however, teaches a process for steam-methane reforming (col. 1, lines 5-11) wherein a portion of the hydrogen produced by the process is recycled to the steam methane reformer for use as fuel (col. 6, lines 18-30).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide a portion of the hydrogen produced by the process is recycled to the steam methane reformer in Retallick for use as fuel (col. 6, lines 18-30) as taught by Anand.

Regarding claims 22 and 25, Retallick fails to teach that the cooling transfer medium is steam generated in the secondary process.

However, '814 teaches that after producing steam from the effluent of the steam reformer, the steam stream is contacted with the steam reformer for the purpose of superheating the steam (page 1, lines 95-101).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide steam as the cooling medium in the passageways of Retallick in order to superheat the steam stream as taught by '814.

Regarding claims 23, 24, 31; '814 teach contacting water with the effluent of the steam reformer. It appears that both the combustion gas and the reforming gas would have heat to transfer to the water. Therefore, it would have been obvious to contact the water with both effluents of Retallick, namely the combustion gas and the synthesis gas in order to produce steam. It appears that this indirect heat exchange would at least partially dry or superheat the steam formed.

Regarding claim 27, '814 teach that steam resulting from cooling steam reactor (#3, 13) is flowed to a heat circulation unit for the purpose of providing more steam (page 2, lines 1-15, fig. 3, #11, 15).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide steam resulting from cooling steam reactor (#3, 13) is flowed to a heat circulation unit in Retallick in order to provide more steam (page 2, lines 1-15, fig. 3, #11, 15) as taught by '814.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Retallick (US 2004/0060238) in view of GB 2006814 ('814) and Anand (US 5435836) and Benham (US 5324335) and Marion (US 4141695) and Iijima (US 2004/0093796) and Monro (US 4444128).

Retallick teaches a method as described above in claim 21.

Retallick fails to teach that the synthesis is cooled by heat exchange in a waste heat boiler, the method further including heating the boiler feed water in indirect heat exchange relationship with the combustion gas from the reformer, before feeding the boiler feed water into the waste heat boiler.

Marion, however, teaches that hot raw synthesis gas can be used to heat boiler feed water (col. 7, lines 35-45).

Iijima teaches that hot combustion gas can be used to heat boiler feed water [0058].

Monro teaches that hot gases can be flowed through a boiler for the purpose of heating the boiler (col. 3, lines 15-27).

As Marion teaches that hot raw synthesis gas can be used to heat boiler feed water (col. 7, lines 35-45), Iijima teaches that hot combustion gas can be used to heat boiler feed water [0058], Monro teaches that hot gases can be flowed through a boiler for the purpose of heating the boiler (col. 3, lines 15-27), it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide the synthesis gas and combustion gas of Retallick in heat exchange with the water that serves as the inlet to the waste heat boiler because it is known in the heat exchange art to do so as taught by Marion and Iijima. Additionally, it would have been obvious to provide the synthesis gas and combustion gas of Retallick flowing through the boiler in order to heat the boiler by direct heat exchange as taught by Monro.

Claim 28, 29, 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Retallick (US 2004/0060238) in view of GB 2006814 ('814) and Anand (US 5435836) and Benham (US 5324335) and Kuester (US 4678860).

Retallick teaches a method as described above in claim 21.

Retallick fails to teach supplying at least a portion of the steam to the hydrocarbonaceous gas conversion plant to satisfy start up requirements.

Kuester, however, teaches a method for producing hydrocarbons (col. 1) wherein steam is flowed to a Fischer-Tropsch reactor for the purpose heating up the slurry in the Fischer-Tropsch reactors during start-up (col. 9, line 65-col. 10, line 3).



Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide steam flowed to a Fischer-Tropsch reactor in Retallick in order to heat up the slurry in the Fischer-Tropsch reactors during start-up (col. 9, line 65-col. 10, line 3) as taught by Kuester.

Regarding the limitation in claims of transferring hydrogen produced from synthesis gas to a primary process (Fischer-Tropsch), Benham teaches steam reforming a fuel to produce synthesis gas wherein the hydrogen produced therefrom is transferred to a Fischer-Tropsch reactor (col. 6) for the purpose of meeting start up demand (col. 11, lines 14-25).

Regarding claims 28, 29, and 32, Kuester teaches that steam is required for start up of the Fischer-Tropsch reactor (col. 9, line 65-col. 10, line 3). Additionally, Benham teaches that hydrogen is required during the start-up of a Fischer-Tropsch reactor (col. 11, lines 14-25). Therefore, one of ordinary skill could determine through routine experimentation how much steam and hydrogen should be produced in the secondary process in order to achieve start-up of the Fischer-Tropsch reactor. Additionally, it would be obvious to one of skill in the art at the time applicant's invention was made to switch the use of the channels between reforming and steam production depending on the demands of the system and because of the reasoned explanation that the heat of the combustion reaction can be used to heat a mixture of hydrocarbon and steam or water to produce steam.

Regarding claims 33 and 34; '814 teaches that after producing steam from the effluent of the steam reformer, the steam stream is contacted with the steam reformer for the purpose of superheating the steam (page 1, lines 95-101).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide steam as the cooling medium in the passageways of Retallick in order to superheat the steam stream as taught by '814.

Additionally, '814 teach contacting water with the effluent of the steam reformer. It appears that both the combustion gas and the reforming gas would have heat to transfer to the water. Therefore, it would have been obvious to contact the water with both effluents of Retallick, namely the combustion gas and the synthesis gas in order to produce steam. It appears that this indirect heat exchange would at least partially dry or superheat the steam formed.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL A. WARTALOWICZ whose telephone number is (571)272-5957. The examiner can normally be reached on 8:30-6 M-Th and 8:30-5 on Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1793

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Paul Wartalowicz  
May 8, 2010

/Stanley Silverman/  
Supervisory Patent Examiner, AU 1793